



**THIRD UNITED NATIONS
REGIONAL
CARTOGRAPHIC CONFERENCE
FOR ASIA AND THE FAR EAST**

27 October – 10 November 1961, Bangkok, Thailand

Vol. 1. Report of the Conference

UNITED NATIONS

Department of Economic and Social Affairs



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CARTOGRAPHIC CONFERENCE
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New York, 1962

NOTE

Symbols of United Nations documents are composed of capital letters combined with figures. Mention of such a symbol indicates a reference to a United Nations document.

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FOREWORD

In accordance with the procedure followed for the two previous regional cartographic conferences, the official records of the Third United Nations Regional Cartographic Conference for Asia and the Far East held in Bangkok, Thailand, from 27 October to 10 November 1961, are being issued in two volumes. Volume 1, the present publication, is the *Report of the Conference*, while Volume 2 (E/CONF/36/3) will be the *Proceedings of the Conference and Technical Papers*, and will contain the summary records of the plenary meetings and the technical and background papers presented to the Conference by the participants.

The official records of the first United Nations Regional Cartographic Conference for Asia and the Far East have already been published as documents E/CONF.18/6 (Sales No.: 55.I.29) and E/CONF.18/7 (Sales No.: 56.I.23), while those of the Second Conference have appeared as documents E/CONF.25/3 (Sales No.: 59.I.29) and E/CONF.25/4 (Sales No.: 61.I.8).

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Chapter I

ORGANIZATION OF THE CONFERENCE

TERMS OF REFERENCE

1. The Third United Nations Regional Cartographic Conference for Asia and the Far East was convened by the Secretary-General of the United Nations in pursuance of resolution 761 A (XXIX) of the Economic and Social Council. The Conference was held at the Headquarters of the Economic Commission for Asia and the Far East at Bangkok, Thailand, from 27 October to 10 November 1961. The Government of Thailand made the physical arrangements and provided the meeting facilities.

ATTENDANCE

2. The following is the list of representatives and observers of participating countries and observers from international organizations, as approved by the Credentials Committee of the Conference.

A. Governments

AFGHANISTAN

Representative:

Mr. Amir Ahmad
Director, Cartographic Institute

AUSTRALIA

Representative:

Mr. George Robert Lindsey Rimington
Assistant Director, Division of National Mapping

CAMBODIA

Representative:

Colonel Ngim Karet
Director, Geographical Service of F.A.R.K.

CANADA

Representative:

Mr. Samuel Gill Gamble
Director, Surveys and Mapping Branch
Department of Mines and Technical Surveys

CEYLON

Representative:

Mr. A. P. R. Dias
Assistant Superintendent of Surveys

CHINA

Representatives:

Mr. Mo Tsao
Adviser to the Ministry of the Interior
(*Chairman of the Delegation*)

CHINA (*continued*)

Representatives (continued)

Mr. Chang Ju-Chen
Chief Instructor, Survey College
Mr. Hsiao Chi Chien
Instructor, Survey College

Alternate representatives:

Mr. Chen Chen-Ming
First Secretary, Embassy of China
Bangkok
Mr. Yeng Chun-Yuan
Ministry of the Interior

FEDERAL REPUBLIC OF GERMANY

Representative:

Mr. Erwin Gigas
Director, Institute of Applied Geodesy
(*Chairman of the Delegation*)

Observers:

Mr. Max Spandau
Embassy of the Federal Republic of Germany
Bangkok
Mr. Helmut Bischoff
Zeiss-Aerotopograph Company
Mr. Hermann Deker
Zeiss-Aerotopograph Company

FEDERATION OF MALAYA

Representatives:

Mr. Arnold Lessel MacMorland Greig
Surveyor General
(*Chairman of the Delegation*)
Mr. Kamarudin bin Haji Ibrahim
Photo-lithographer, Survey Department

FRANCE

Representative:

Mr. Georges Laclavère
Inspector General
Chief, Cartographic Service
Institut géographique national

Alternate representative:

Mr. Jean Dominique Paolini
Permanent Representative of France to the Economic Commission for Asia and the Far East
Bangkok

Secretary:

Mr. René Hussenet
Embassy of France
Bangkok

INDIA

Representatives:

Colonel Jamna Narain Sinha
Deputy Surveyor General, Survey of India
(*Chairman of the Delegation*)
Commander D. C. Kapoor
Hydrographic Branch
Ministry of Defence

INDONESIA

Observer:

Mr. Toman Hutagalung
Third Secretary (Economic), Embassy of Indonesia
Bangkok

IRAQ

Representative:

Mr. Mohammed Salih Haider
Acting Director General of Survey
Survey Department

ISRAEL

Representative:

Mr. Joseph Elster
Director, Survey Department
Ministry of Labour

JAPAN

Representatives:

Dr. Takamasa Nakano
Chief, Map Division
Geographical Survey Institute
Ministry of Construction
(*Chairman of the Delegation*)
Mr. Yoshinao Odaka
Third Secretary, Embassy of Japan
Bangkok
Mr. Akira Sinzi
Vice-Chief, Astronomical Section
Hydrographic Office
Maritime Safety Board
Mr. Kazuo Muraoka
Researcher, Geodetic Division
Geographical Survey Institute
Ministry of Construction

Adviser:

Mr. Katsuichi Naohara
Chief Photogrammetrist, Kokusai Aerial Survey
Company

LAOS

Representatives:

H. E. Phouangkeoh Phanareth
Secretary of State for Public Works
(*Chairman of the Delegation*)
Mr. Khounta
Director General of Public Works and Transport
Mr. Chansamone Voravong
Director, Geographical Service
Mr. Gely Robert
Expert, Geographical Service

MOROCCO

Representatives:

Mr. Mamdouh Jamil
Engineer, Topographic Service
Mr. Cadoch Delmar Chalom
Engineer, Topographic Service

NETHERLANDS

Representative:

Mr. W. Schermerhorn
Director, International Training Centre for Aerial
Survey

PHILIPPINES

Representatives:

Captain Cayetano Palma
Assistant Director, Bureau of Coast and Geodetic
Survey
(*Chairman of the Delegation*)
Commander Marcelino Tabin
Executive Director, Technical Surveys and Maps
(*Vice-Chairman of the Delegation*)
Mr. Manuel Abrogar, Jr.
Chief, Cartographic Division
Bureau of Coast and Geodetic Survey
Mr. Ernesto Dollete
Assistant Chief, Cartographic Division
Census Bureau

REPUBLIC OF KOREA

Representatives:

Lieutenant-Colonel Chul Whan Oh
Commanding Officer, Republic of Korea Army Map
Service
(*Chairman of the Delegation*)
Captain Jong Sohk Soh
Commanding Officer, Aerial Photographic Repro-
duction Company
Republic of Korea Army
Mr. Soung Jeek Paik
Chief, Photomapping Branch
Mapping Section
National Construction Research Institute

SAUDI ARABIA

Representatives:

Mr. Abdel Karim Ghalayini
Deputy Chief, Technical Department
Ministry of Petroleum and Mineral Resources
Mr. Hashim Shigdar
Deputy Chief, Geological Section
Directorate of Mineral Resources

SWEDEN

Representatives:

Mr. Josef Börje Lundgren
Director General, Geographical Survey Office of
Sweden
(*Chairman of the Delegation*)
Mr. Lars Arvid Ahstrand
Director in Chief, Swedish National Map and Print-
ing Organization

SWITZERLAND

Representative:

Mr. Robert Scholl
Engineer, Wild Heerbrugg S.A.

Observer:

Mr. René Vizio
Engineer, Wild Heerbrugg S.A.

THAILAND

Representatives:

Major-General Busrindre Bhakdikul
Chief, Survey Department
Royal Thai Army
(*Chairman of the Delegation*)
Luang Vithityontrakarn
Director of Constructions
State Railway of Thailand
Ministry of Communications
Khun Prajacket Bhumipach
Surveyor General, Department of Lands
Ministry of the Interior
Mr. Roem Purnariksha
Deputy Director, Department of Agriculture
Ministry of Agriculture
Mr. Dusit Banijbatana
Deputy Director General, Royal Forest Department
Ministry of Agriculture
Captain Sophon Tongkumvongsa
Chief, Surveying Division
Hydrographic Department
Royal Thai Navy
Captain Amporn Phenyapol
Hydrographic Department
Royal Thai Navy
Captain Prapat Phodhipala
Chief, Cartographic Division
Hydrographic Department
Royal Thai Navy
Colonel Chumphon Kulkasem
Chief, Photogrammetric Division
Survey Department
Royal Thai Army
Lieutenant-Colonel Swasdi Paohimkul
Chief, Geodetic Division
Survey Department
Royal Thai Army
Lieutenant-Colonel Burin Uppalakalin
Chief, Triangulation Section
Survey Department
Royal Thai Army
Lieutenant-Colonel Vira Suvannus
Instructor, Survey School
Survey Department
Royal Thai Army
Lieutenant-Colonel Phayon Phumhiran
Chief, Cartographic Section
Survey Department
Royal Thai Army

THAILAND (continued)

Representatives (continued)

Lieutenant-Colonel Sawong Yuhun
Chief, Control Survey Section
Survey Department
Royal Thai Army
Lieutenant-Colonel Prachuap Niamloy
Chief, Map Compilation Section
Survey Department
Royal Thai Army
Lieutenant-Colonel Chitti Indrathat
Chief, Topographic Survey Section
Survey Department
Royal Thai Army
Lieutenant-Colonel Phoonphon Asanachinta
Instructor, Survey School
Survey Department
Royal Thai Army
Commander Viratana Sarindu
Chief, Oceanographic Division
Hydrographic Department
Royal Thai Navy
Police Lieutenant-Colonel Vichit Lertlam
Chief, Mapping Division
Metropolitan Police
Ministry of the Interior
Major Padung Soikam
Chief, Photo Producing Section
Survey Department
Royal Thai Army
Major Prasit Lokluang
Chief, Classification Survey Section
Survey Department
Royal Thai Army
Lieutenant-Commander Monthian Ruenvongsa
Chief, Marine Survey
Port Authority of Thailand
Ministry of Communications
Major Rian Hiranbamrung
Control Survey Section
Survey Department
Royal Thai Army
Mom Luang Pilandhna Malakul
Superintendent Engineer, Irrigation Department
Ministry of Agriculture
Captain Yod Peunglaow
Instructor, Survey School
Survey Department
Royal Thai Army
Flight-Lieutenant Panom Piemsuwan
Survey Section
Directorate of Matériel
Royal Thai Air Force
Mr. Saman Buravas
Deputy Director General, Department of Mines
Ministry of Industry
Mr. Sern Nungkandi
Superintendent Engineer, Technical Division
State Railway of Thailand
Ministry of Communications

THAILAND (continued)

Representatives (continued)

Flying Officer Yudna Yantdilok
Chief, Aircraft Accident Investigation Section
Civil Aviation Administration
Department of Transport
Ministry of Communications

Mr. Chamlong Saligupta
Chief Civil Engineer, Department of State Highways
Ministry of Communications

Dr. Setwit Suvannetr
Civil Engineer, Department of State Highways
Ministry of Communications

Mr. Charas Phalakonkun
Chief, Cartographic Section
Department of Lands
Ministry of the Interior

Mr. Sarit Watanasuk
Chief, Mine Surveying Division
Department of Mines
Ministry of Industry

Mr. Chootagoon Suwanaket
Chief, Cadastral Mapping Division
Department of Lands
Ministry of the Interior

Dr. Chai Muktabhant
Head of Department of Civil Engineering
Civil Aviation Administration
Department of Transport
Ministry of Communications

Mr. Thongchai Sopondisya
Forest Officer, Royal Forest Department
Ministry of Agriculture

Mr. Suthep Tingsabathat
Science Engineer, Irrigation Department
Ministry of Agriculture

Mr. Rawi Bhavilai
Head of the Astronomy Section
Physics Department
Chulalongkorn University

Mr. Sa-ard Boonkird
Senior Lecturer
University of Agriculture

Mr. Sarot Montrakun
Soil Technologist, Rice Department
Ministry of Agriculture

Mr. Meechai Chairsakeo
Lecturer at the College of Engineering
Chulalongkorn University

UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN
IRELAND

Representative:

Mr. George James Humphries
Deputy Director of Overseas Surveys
Department of Technical Co-operation
Directorate of Overseas Surveys

UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN
IRELAND (continued)

Adviser:

Lieutenant-Colonel I. C. C. Mackenzie
A.D. Survey, General Headquarters
FARELF
Singapore

Observers:

Mr. Kenneth Norman Toms
District Surveyor, Lands and Survey Department
North Borneo

Mr. Ronald Thomas Russell
Director, Lands and Surveys Department
Sarawak

Colonel Westland Wright
Hunting Surveys, Ltd.

UNITED STATES OF AMERICA

Representative:

Rear Admiral H. Arnold Karo
Director, United States Coast and Geodetic Survey

Alternate representative:

Mr. C. Etzel Percy
The Geographer of the United States Department
of State

Advisers:

Mr. Charles H. Andregg
Chief, Plans and Production Staff
United States Army Map Service

Mr. Philip M. Davenport
United States Liaison Officer to the Economic
Commission for Asia and the Far East
Embassy of the United States
Bangkok

Mr. Robert D. Dixon
Assistant Director of Operations
Aeronautical Chart and Information Center
United States Air Force

Mr. Gordon B. Littlepage, Jr.
Technical Assistant to the Assistant Director for
Cartography
United States Coast and Geodetic Survey

Mr. Merritt W. Matthews
General Engineer, Office of the Chief of Engineers
United States Army

Mr. Earl Josiah Rogers
Research Forester
United States Department of Agriculture

Mr. Rupert B. Southard, Jr.
Chief, Office of International Activities
Topographic Division
United States Geological Survey

Mr. Melvin E. Tyrrell
Federal Aviation Agency

Mr. Richard T. Whistler
Assistant United States Liaison Officer to the Eco-
nomic Commission for Asia and the Far East
Embassy of the United States
Bangkok

UNITED STATES OF AMERICA (continued)

Observers:

Lieutenant-Colonel Francis G. McBride
Commanding Officer, United States Army Map
Service, Far East
Tokyo

Lieutenant-Colonel James R. Seiler
Commander, 7651st Aeronautical Chart and Infor-
mation Squadron
APO 323
San Francisco
California

Mr. Charles T. Whalen
Gravity Plans and Requirements
1381st Geodetic Survey Squadron
Orlando
Florida

Mr. David L. Mills
Chief, Department of Geodesy
United States Army Map Service

Mr. Bennett Richman
Geographer's Office
Department of State

Mr. Richard A. Newsham
Geographic Attaché
Embassy of the United States
New Delhi

Mr. Louis J. Roberts
Project Engineer, United States Army Map Service

B. United Nations Specialized Agencies

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED
NATIONS

Dr. H. N. Mukerjee

INTERNATIONAL CIVIL AVIATION ORGANIZATION

Mr. H. M. D. Jansz

UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTU-
RAL ORGANIZATION

Mr. L. Mattson

Mr. A. L. Gardner

C. Inter-governmental Organizations

International Hydrographic Bureau

Vice Admiral Vicharn Desakorn

European Organization for Experimental Photogram-
metry Research

Mr. Erwin Gigas

D. International Scientific Organizations

International Geographical Union

Mr. Georges Laclavère

International Union of Geodesy and Geophysics

Mr. Georges Laclavère

E. United Nations Secretariat

1. Headquarters

Dr. Te-Lou Tchang
Chief, Cartographic Section
Resources and Transport Economics Branch
Department of Economic and Social Affairs
(Executive Secretary)

Mr. Christ N. Christofis
Cartographic Section
Resources and Transport Economics Branch
Department of Economic and Social Affairs
(Assistant to the Executive Secretary)

2. Economic Commission for Asia and the Far East

Dr. Koichi Aki
Chief, Bureau of Flood Control and Water Resources
Development

Dr. C. Y. Li
Chief, Mineral Resources Development Section
(Technical Secretary)

Mr. Wayne P. Lee
Professional Assistant, Mineral Resources Develop-
ment Section
(Assistant)

Mr. Leonard A. Berry
Chief, Information Service

OFFICIAL ADDRESSES¹

3. Dr. Te-Lou Tchang, Executive Secretary of the
Conference, opened the Conference on behalf of the
Secretary-General of the United Nations. H.R.H. Prince
Wan Waithayakon, Deputy Prime Minister of Thailand,
delivered the welcome address.

VOTE OF THANKS

4. The Conference adopted by acclamation a vote of
thanks to the host Government of Thailand for the
excellent arrangements made for the Conference and for
the kind hospitality extended to the participants.

ADOPTION OF THE RULES OF PROCEDURE

5. The Conference adopted the rules of procedure of
the two previous United Nations Regional Cartographic
Conferences for Asia and the Far East as the rules of
procedure for this Conference.²

OFFICERS OF THE CONFERENCE

6. The Conference elected the following officers of
the Conference:

President: Major-General Busrindre Bhakdikul (Thailand)

Vice-Presidents: Captain Cayetano Palma (Philippines)

Colonel Jamna Narain Sinha (India)

Rapporteur: Mr. A. P. R. Dias (Ceylon)

¹ The text of these addresses will be found in *Third United Nations Regional Cartographic Conference for Asia and the Far East, Vol. 2 — Proceedings of the Conference and Technical Papers (E/CONF.36/3)*.

² See *United Nations Regional Cartographic Conference for Asia and the Far East, Vol. 2 — Proceedings of the Conference and Technical Papers (Sales No.: 56.L23)*, pages 130 and 131.

AGENDA

7. The Conference had before it a provisional agenda (E/CONF.36/1 and Corr.1 and 2) prepared by the Secretariat on the basis of proposals received from the Governments of Australia, Burma, India, Japan, the Netherlands, New Zealand, Thailand, the United Kingdom of Great Britain and Northern Ireland and the United States of America. The provisional agenda was used as a guide for the organization of discussions. In the light of the consideration of the provisional agenda's subject matter, the items were rearranged and their groupment simplified. The final agenda adopted by the Conference is given below.

1. Adoption of the rules of procedure
2. Election of officers
3. Adoption of the agenda
4. Report on credentials
5. Establishment of technical committees
6. Progress reports by countries on their respective cartographic activities since the last Conference
7. Reports on progress in matters which formed the basis of the resolutions or recommendations at the last Conference
8. Establishment of a regional inter-governmental cartographic organization
9. Establishment of a regional training centre for surveying and mapping
10. Geodesy
 - (a) Review of new techniques and developments
 - (b) Classification and standards of accuracy for geodetic control surveys
 - (c) International connexion of geodetic co-ordinates
 - (d) Establishment of standard base lines for calibrating radio-electronic or electromagnetic distance measuring instruments
 - (e) Gravity
11. Magnetic surveys and world magnetic charts
12. Hydrography and oceanography
 - (a) Review of new techniques and developments
 - (b) Chart format and symbolization
 - (c) Promotion of precise sounding for shallow waters and continental shelves
 - (d) Study of the representation of coastlines appearing in various charts and maps
 - (e) Tides
13. Topography and photogrammetry
 - (a) Review of new techniques and developments
 - (b) International standardization of map scales, format, accuracy classification and map symbols
 - (c) Co-operation in mapping of frontier areas
 - (d) Organization and operation of a national map information office
14. Photo-interpretation
 - (a) Review of new techniques and developments
 - (b) Exchange of interpretation key and material among regions lying on the same climatic belts and zones
15. Topical maps
 - (a) Review of new techniques and developments
 - (b) Small-scale base maps (scales 1:250,000 to 1:5,000,000) for use in preparing topical maps
 - (c) Projection system, conventional signs, legends and romanization for topical maps
 - (d) Regional atlas

16. Aeronautical charts
17. Specifications of the International Map of the World on the Millionth Scale (IMW)
18. Geographical names
19. Adoption of the report of the Conference

ESTABLISHMENT OF TECHNICAL COMMITTEES

8. The Conference established five committees of the whole to which technical questions were referred. The assignment of items to each committee is given below.

<i>Committee I</i>	
Geodesy	Item 10
<i>Committee II</i>	
Topography and photogrammetry	Item 13
<i>Committee III</i>	
Photo-interpretation and topical maps	Items 14 and 15
<i>Committee IV</i>	
International Map of the World, World Aeronautical Charts and geographical names	Items 16, 17, and 18
<i>Committee V</i>	
Magnetic surveys and world magnetic charts; hydrography and oceanography	Items 11 and 12

OFFICERS OF THE TECHNICAL COMMITTEES

9. The five committees elected their officers as follows:

- Committee I*
 Chairman: Mr. G. R. L. Rimington (*Australia*)
 Vice-Chairman: Mr. Kazuo Muraoka (*Japan*)
 Rapporteur: Commander Marcelino Tabin (*Philippines*)
- Committee II*
 Chairman: Colonel Chumphon Kulkasem (*Thailand*)
 Vice-Chairman: Mr. Amir Ahmad (*Afghanistan*)
 Rapporteur: Mr. R. T. Russell (*United Kingdom of Great Britain and Northern Ireland*)
- Committee III*
 Chairman: Mr. A. L. M. Greig (*Federation of Malaya*)
 Vice-Chairman: Mr. Soung Jeek Paik (*Republic of Korea*)
 Rapporteur: Mr. K. N. Toms (*United Kingdom of Great Britain and Northern Ireland*)
- Committee IV*
 Chairman: Mr. Chansamone Voravong (*Laos*)
 Vice-Chairman: Mr. Mo Tsao (*China*)
 Rapporteur: Mr. Kamarudin bin Haji Ibrahim (*Federation of Malaya*)
- Committee V*
 Chairman: Mr. Akira Sinzi (*Japan*)
 Vice-Chairman: Commander D. C. Kapoor (*India*)
 Rapporteur: Mr. Manuel Abrogar, Jr. (*Philippines*)

CREDENTIALS

0. The President of the Conference reported that Credentials Committee, composed of the President and the two Vice-Presidents, had examined the credentials submitted by the delegations and found them in order.

CLOSING SESSION

1. Major-General Busrindre Bhakdikul, Chairman of the Delegation of Thailand and President of the Con-

ference, expressed his appreciation for the co-operation rendered by all delegations and the United Nations Secretariat and said that he felt confident that the results of this Conference would strengthen the bonds among the participating countries.

12. The representative of the United States of America stated on behalf of all delegates that the Conference had been a most memorable and constructive one which had laid the groundwork for continuing the good work throughout the coming years.

Chapter II

RESOLUTIONS ADOPTED BY THE CONFERENCE

13. The work done by the Conference is embodied in the resolutions of the Conference and the reports of the five technical committees. The resolutions are reproduced in this chapter and the substance of the reports of the committees is given in annexes I to V. A check list of documents issued for the Conference, including background and technical papers submitted by the participating Governments in connexion with the various items of the agenda, can be found in annex VI.¹

1. UNITED NATIONS TECHNICAL ASSISTANCE

The Conference,

Noting with satisfaction the substantive progress made by the national cartographic institutes of the region during recent years,

Realizing that in many instances such progress had been possible partly through the assistance provided by the United Nations,

Noting that new national institutes will have to be established where such institutes do not exist, that some existing national institutes require further development and that some training centres for regional or sub-regional uses are required for meeting the urgent needs of countries of the region for qualified technical personnel to carry out specific cartographic work,

Considering that action at a regional or sub-regional level would also be necessary to meet the requirements of co-operative projects,

Requests the United Nations, through its technical co-operation programmes (including the Special Fund):

(a) To give priority to country requests for strengthening their national cartographic institutes and for carrying out specific projects in the field of cartography, including the preparation of resources inventory maps;

(b) To appoint a regional cartographic adviser to assist in the implementation of the Conference resolutions and recommendations in countries of the region through constant review of the progress made and other activities and in the planning and organization of the cartographic work, particularly in the preparation of projects requests for United Nations technical co-operation;

(c) To assist in the establishment and carrying out of regional or sub-regional co-operative projects, including financial assistance to experts for attending *ad hoc* working groups and other relevant meetings.

10 November 1961.

¹ The full text of these documents will be found in *Third United Nations Regional Cartographic Conference for Asia and the Far East, Vol. 2—Proceedings of the Conference and Technical Papers (E/CONF 36/3)*.

2. FOURTH UNITED NATIONS
REGIONAL CARTOGRAPHIC CONFERENCE FOR ASIA
AND THE FAR EAST

The Conference,

Noting that the interval between two successive regional cartographic conferences for Asia and the Far East has been three years,

Recommends to the Economic and Social Council that the next United Nations Regional Cartographic Conference for Asia and the Far East be convened not later than 1964.

10 November 1961.

3. WORKING GROUP ON REGIONAL ORGANIZATIONS

The Conference,

Recalling the importance attached by the Economic and Social Council to the strengthening of international co-operation and co-ordination in the field of cartography, and

Recalling further the study made by previous conferences for the establishment of a regional cartographic organization,

Realizing that the regional cartographic conferences for Asia and the Far East have been called at three-year intervals,

Conscious of the urgent need for continuity in the co-operative work between conferences and for provision of advice to Governments of the region on cartographic problems encountered at the policy-making level,

Recommends that after the session of the Conference its Working Group on Regional Organizations² continue to function with the following tasks:

(a) To examine further the various problems connected with the establishment of a regional cartographic organization and to carry out related preliminary work; and

(b) To report the progress made to the next conference

10 November 1961.

4. ESTABLISHMENT OF SUB-REGIONAL TRAINING CENTRE
FOR PHOTO-INTERPRETATION

The Conference,

Recognizing that the fulfilment of the need for competent technical personnel in photo-interpretation requires the establishment of training centres in order to speed

² The group is composed of delegates from the cartographic agencies of the following countries: Ceylon, China, Federated States of Malaya, India, Japan, Laos, the Philippines and Thailand with the delegate of India acting as Secretary.

up the provision of basic data for economic development of the region,

1. *Recommends* that an informal working group be set up composed of interested countries in the region³ to study the question of the establishment of sub-regional training centres for photo-interpretation in the region and to report their findings at the next regional conference;

2. *Further recommends:*

(a) That these sub-regional centres should deal with each of the following subjects: photo-geology, photo-interpretation for soil mapping and photo-interpretation for forest resources mapping;

(b) That they should be well distributed in the region, taking into account the prevailing languages, the possibility of exchange of experts among the countries of the region and the availability of (i) academic courses for those candidates who need to take preparatory studies, (ii) technical facilities, such as photography and instruments, (iii) building and servicing personnel and (iv) qualified national and international experts.

10 November 1961.

5. MAP INFORMATION OFFICE

The Conference,

Noting the usefulness of a map information office,

1. *Recommends* the acceptance of the offer of the Government of Thailand to establish a centre for cartography in Bangkok with host facilities provided by its Survey Department;

2. *Further recommends* that this centre should be entrusted with the following main tasks:

(a) The collection of basic literature on cartography, maps and other material of regional interest;

(b) The dissemination to the countries of the region of information on inventory of such material and on places where such material can be obtained;

(c) The carrying out of other related work as may be assigned by the Conference.

10 November 1961.

6. INTERNATIONAL CONNEXION OF GEODETIC CO-ORDINATES

A

The Conference,

Noting:

(a) That several links of the geodetic chain between Europe and the Far East have not yet been connected, in particular (i) the link between the Federation of Malaya and Thailand and (ii) the link between Singapore, the Borneo Territories and the Philippines on the one hand and that between Singapore and Australia through Indonesia on the other;

(b) That with the modern equipment now available, it would be feasible to effect these junctions in order to consolidate the geodetic surveys of the region,

³ The following countries have already offered to participate in the work of the group: China, India, Japan, the Philippines and Thailand.

Noting further the generous offer of the United States of America to assist in carrying out some measurements which would require the use of long-range electronic measuring equipment and related technical facilities,

1. *Agrees* on taking practical steps to achieve the connexions mentioned above;

2. *Expresses* the desirability of maintaining liaison with Brigadier Bomford and other eminent geodesists as suggested by the Secretary-General of the International Union of Geodesy and Geophysics;

3. *Recommends* that a corresponding body composed of interested parties should be established with the primary tasks of advising the heads of the cartographic services concerned as to the steps to be taken to effect the junctions referred to above and of maintaining liaison with the Cartographic Section of the United Nations and with technical units of other interested international organizations.

B

The Conference,

Noting that Australia, the Federation of Malaya, the Philippines, Thailand, the United Kingdom and the United States of America have intimated that they would be prepared to participate actively in the suggested corresponding body with a view to attaining the ends agreed to and sought by the geodesists throughout the world,

Recommends that the Secretary of the corresponding body should be the nominee of the Federation of Malaya.

10 November 1961.

7. CLASSIFICATION AND STANDARDS OF ACCURACY FOR GEODETIC SURVEYS

The Conference,

Realizing the need for a uniform system of classification and standards of accuracy for geodetic surveys,

Noting the comprehensive treatment of this subject contained in the Report of Study Group No. 14 presented to the International Union of Geodesy and Geophysics at Helsinki in 1960,

Concluding that the standards included in this document have received favourable consideration throughout the world,

Recommends that all cartographic services participating in this Conference give careful consideration to the principles set forth in the Report of Study Group No. 14.

10 November 1961.

8. GRAVITY

The Conference,

Recognizing the increased importance of accurate standard gravimetric observations in mineral prospecting and in various scientific research activities,

Recognizing further that the rapidly expanding sea gravimetric observations require frequent calibrations at standard gravimetric stations ashore in order to ensure the maximum value of the observations,

Reaffirms resolution 9, "Observation of National Gravimetric Nets and their International Connexion", adopted by the Second United Nations Regional Cartographic Conference for Asia and the Far East, which urged the International Union of Geodesy and Geophysics "to take forthwith action for promoting the required international connexions, national gravity nets and gravity measurement at sea", such as the International Indian Ocean Expedition to be held from 1961 to 1965.

10 November 1961.

9. ORTHOPHOTOGRAPHY

The Conference,

Noting the recently developed methods, equipment and techniques for producing uniform scale photographic products, called orthophotographs,

Realizing the apparent potential in the use of these orthophotographs in the production of maps and map substitutes for engineering, geological, agronomic and forestry uses and in particular for general revision purposes,

Recommends that further information on these interesting techniques be made available as soon as possible to all cartographic agencies so that these agencies may consider the possibility of using these new techniques in their own cartographic organizations.

10 November 1961.

10. DIGITAL METHODS AND ELECTRONIC COMPUTERS IN AERIAL TRIANGULATION

The Conference,

Considering:

(a) The apparent promise of digital methods and electronic computers in aerial triangulation;

(b) That insufficient conclusive data have been published from which a final evaluation of these methods can be derived, and

(c) The instrumental problems involved in the regular production use of these methods,

Recommends that the cartographic services of the region should follow with interest the further developments and that full information concerning results and progress should be made available to the cartographic services as soon as possible.

10 November 1961.

11. CO-OPERATION IN MAPPING OF FRONTIER AREAS

The Conference,

Considering:

(a) That the taking of aerial photographs in frontier areas often raises serious problems;

(b) That the topographic operations necessary for the making of maps of border areas require the establishment of horizontal and vertical ground control on both sides of the border,

Recognizing:

(a) That the necessity for countries having common frontiers to co-operate by providing mutual assistance promptly and sincerely so that the work necessary for the mapping of frontier areas shall be effected within an agreed time and without hindrance;

(b) That an area of free passage must be made available to cartographic workers, the depth on either side of the border depending upon the need for completing an accurate survey,

Recommends that the cartographic services of the countries having problems in mapping bordering areas should:

(a) Prepare jointly draft agreements on co-operation for mapping bordering areas and submit them to their respective governments for approval;

(b) Undertake, after the signing of the agreements, the necessary actions for an efficient implementation of the agreements;

(c) Provide mutual assistance in the areas to ensure normal progress of the survey work to be carried out.

10 November 1961.

12. REGIONAL ECONOMIC ATLAS

The Conference,

Recognizing the increasing need for international co-operation in topical mapping,

Noting that significant progress has already been made by the Economic Commission for Asia and the Far East in the preparation and publication of the regional Geological Map and other related maps,

Appreciating the offer of the Government of Thailand to initiate the compilation and publication of a regional economic atlas,

Recommends to the interested countries that they co-operate with the Government of Thailand by supplying relevant data and information as soon as possible.

10 November 1961.

13. UNITED NATIONS TECHNICAL CONFERENCE ON THE INTERNATIONAL MAP OF THE WORLD ON THE MILLIONTH SCALE (IMW)

The Conference,

Having noted with interest the decision of the United Nations to convene in 1962 in Bonn a United Nations Technical Conference for the review and revision of the specifications for the IMW series,

Considering that many countries are waiting for the revised specifications before launching an intensive programme of publication of IMW sheets,

1. *Calls the attention* of governments concerned and of the aforementioned conference to the urgent need for arriving at definite conclusions and for reaching an agreement concerning the said specifications;

2. *Urges:*

(a) The countries of the region to take part in the Bonn Conference;

(b) All countries concerned to communicate their studies and proposals at least six months before the opening of the Conference, and to draft proposals for amendments with special care.

10 November 1961.

14. SPECIFICATIONS OF THE INTERNATIONAL MAP OF THE WORLD ON THE MILLIONTH SCALE (IMW)

The Conference,

Recalling that conditions prevailing in this region warrant a large degree of flexibility in the specifications of the IMW,

Requests the United Nations Technical Conference on the International Map of the World on the Millionth Scale to take this factor into account when drawing up the final specifications.

10 November 1961.

15. GEOGRAPHICAL NAMES

The Conference,

Noting that the forthcoming United Nations Technical Conference on the International Map of the World on the Millionth Scale will be called by the United Nations in Bonn in August 1962,

Noting further that general guide-lines on spelling of place names for the IMW and WAC series are contained in the specifications of those series and that the task of the Bonn Conference includes the revision of IMW specifications,

1. Recommends that the cartographic services of this region, pending decisions to be made at the Bonn Conference, take into account the Report of the Group of Experts on Geographical Names⁴ and Economic and Social Council resolution 814 (XXXI) in their work of national standardization of place names;

2. Urges that the countries concerned carry out the above recommendation and transmit the results of their work to the Secretary-General of the United Nations.

10 November 1961.

16. AERONAUTICAL INFORMATION FOR COMPILATION OF CHARTS

The Conference,

Recognizing:

(a) That safe air navigation requires timely and accurate aeronautical charts and aeronautical information;

(b) That, for the production of such charts, each country must have a responsible and valid source of aeronautical information,

Recommends to the countries of the region that they:

(a) Provide a centralized source of aeronautical information for their respective countries in conjunction with their cartographic services;

⁴ See United Nations, *World Cartography*, vol. VII (document ST/SOA/SER L/7).

(b) Take appropriate steps to facilitate timely international exchange of aeronautical information required in support of aeronautical charting.

10 November 1961.

17. EXCHANGE OF INFORMATION FOR COMPILATION OF CHARTS

The Conference,

Recognizing that aeronautical cartographic requirements are changing with the dynamic increase and development of aviation,

Considering:

(a) That aeronautical charts and flight information must meet current aviation needs;

(b) The necessity for frequent development and change in format and content of aeronautical charts and flight information materials;

(c) That cartographic methods and techniques are major factors in the ability to meet aeronautical cartographic requirements,

Recommends to the countries of the region that they:

(a) Give attention to the changing nature of aeronautical cartographic requirements when considering their needs for aeronautical charts and flight information;

(b) Take appropriate measures to effect with other nations a frequent exchange of information on their current aviation requirements for aeronautical charts and flight information;

(c) Encourage and seek development and improvement in the cartographic methods and techniques associated with aeronautical charting.

10 November 1961.

18. MAGNETIC OBSERVATIONS

The Conference,

Noting the programme of the observations of the International Indian Ocean Expedition,

Recognizing the importance of magnetic data for the study of the ocean and other scientific work,

Recommends to the countries bordering the Indian Ocean that they intensify their magnetic observations ashore in co-ordination with the International Indian Ocean Expedition, so that maximum benefit may be derived from both the shore observations and the ocean observations.

10 November 1961.

19. SOUNDING OF SHALLOW WATERS

The Conference,

Noting that accurate sounding of shallow waters is useful not only to the safety of navigation but also to the delineation of submarine topography for study of continental shelf and engineering work,

Recommends to the interested countries in the region that they promote precise sounding in shallow waters and on the continental shelf and that they exchange information on improved hydrographic techniques applied to these surveys as well as on the results of the surveys.

10 November 1961.

20. OCEANOGRAPHY

The Conference,

Noting the increased interest and activity in oceanographic programmes,

Recognizing the importance of oceanographic data to the scientific knowledge of the world,

Urges the countries of the region to collect and record oceanographic data, including geomagnetic, gravimetric and geological data as well as chemical, physical and biological data, in connexion with their normal hydrographic work and to make these data available through recognized oceanographic centres.

10 November 1961.

21. OBSERVATION OF SEISMIC SEA WAVE AND STORM SURGE

The Conference,

Recognizing the importance of an adequate seismic sea wave and storm surge warning system to nations bordering the Pacific Ocean and in other areas,

Recognizing further that the present state of knowledge concerning the evolution and transmission of seismic sea waves and storm surges does not enable an accurate prediction of the magnitude of the wave to be forecast (although the forecast of the arrival time is accurate to within a few minutes),

Noting that the adequate understanding of the seismic sea wave and storm surge phenomena still requires intensive study by a large number of competent services,

Recommends to the cartographic services present at this Conference that they assist in every possible way in research on and study of sea wave and storm surge phenomena with the particular objective of obtaining accurate predictions of magnitude and other parameters.

10 November 1961.

ANNEX I

Report of Committee I on geodesy

Review of new techniques and developments [item 10 (a)]

Under this item, the Committee considered a communication (E/CONF.36/L.32) from the United States, containing five papers: "Investigation of the air-borne profile recorder" by the United States Army Map Service; "Portable surveying tower" and "Flashing signal lamp" by the United States Geological Survey, and "Use of tellurometer for calibration of electronic navigation aids" and "Tellurometer for control survey" by the United States Navy Hydrographic Office. During the discussion, the Committee noted with interest that tests made by the United States Army Map Service of the air-borne profile recorder (APR) on strips up to 215 miles long, flown at an altitude of 30,000 feet above mean sea level, demonstrated that accuracies of up to ten feet RMSE^a in flat areas and twenty feet RMSE in mountainous terrain could be obtained by the use of APR data in stereotriangulation, and that the results in mountainous terrain could be improved by relating the APR profile to the profile obtained from a preliminary stereotriangulation orientation of the aerial photographs.

The Committee also noted that the tower described in the paper on the "Portable surveying tower" was suitable for use in lengths of from ten to seventy-six feet in six-foot increments and could be equipped with towing wheels which could be used on light-weight vehicles, while two men could erect the tower in one hour.

The effective and economical use of the tellurometer for the calibration of hyperbolic electronic navigational aids was also noted.

With respect to the use of the tellurometer for control surveys, the Committee heard a report by the United States Navy Hydrographic Office that this instrument has been used to make the distance measurements for secondary control points in a closed-loop traverse.

Measurement of small movements in the earth's crust

On this subject, the Committee considered a paper presented by the United States of America (E/CONF.36/L.33) and noted with interest the technique used in the United States to detect crustal movements on the order of from two to three centimetres per year, where a first-order triangulation network was employed which was re-observed at regular intervals. It was further reported that these observations will be continued for an additional period of perhaps more than 100 years.

The representative of Japan drew attention to the value of systematic re-measurements of bench-marks for vertical control. These measurements could indicate the vertical movements of the earth's crust. The data obtained could be valuable when considering the location of future industrial sites.

The Committee was of the general opinion that, in the vicinity of areas subject to earth disturbances, it would be desirable for permanent monuments to be established with the objective of measuring regularly both their horizontal and their vertical displacement. Such measurements would contribute to the study of the movement of the earth's crust.

Satellite geodesy

Two papers on this subject were before the Committee: one entitled "Use of near earth satellite orbits for geodetic information" (E/CONF.36/L.34) presented by the United States of America and another entitled "World coverage by satellite geodesy"

^a Random mean square error.

(E/CONF.36/L.5) received from Japan. The Committee noted that the use of satellites for geodetic observations would open up a new era in geodetic determinations and felt that the United States should be congratulated on the leading role it has played in this scientific investigation and in particular on the comprehensive treatment of the relevant formulae used in orbital studies which were presented. During the general discussion, the Committee appreciated the fact that it would be some years before satellites for geodetic purposes could be effectively used and agreed with the opinion expressed in the background paper E/CONF.36/L.5 that it would be appropriate to set up a working group composed of representatives from countries in Asia and the Far East when sufficient progress had been achieved. This group would then be able to consider the application of satellite observations to geodetic connexions in this region.

Change of spheroid

The representative of the United States of America informed the Committee that the paper "The isoparametric method of mapping one ellipsoid on another" (E/CONF.36/L.35) was submitted for the purpose of giving a more rigorous mathematical treatment to a problem studied in a similar paper submitted to the meeting of the International Union of Geodesy and Geophysics in 1960. The paper deals with a method of transforming co-ordinates from one spheroid to another. The Committee believed the method worthy of consideration by interested services when such processes were contemplated.

Electronic processing of geodetic data

The Committee considered the technical paper "Application of small electronic computers to geodetic survey computation" submitted by the United States of America (E/CONF.36/L.36), noted with interest the experiences reported during the discussion by the delegates from Australia, Canada, the Federal Republic of Germany, France, the Netherlands, the Philippines, Switzerland and the United States of America and agreed with the following observations:

(a) That these machines were time saving, in spite of their high initial cost, but that there was a need for caution against possible breakdowns and loss of time if maintenance personnel were not available;

(b) That there was a need for an adequate number of maintenance personnel to be on hand in order to eliminate possible breakdowns;

(c) That the operation of such machines should be planned not only for geodetic computations but also for other related fields, and that two or three shifts per day should be programmed.

Observation of seismic sea wave and storm surge

The Committee considered a communication from the United States of America (E/CONF.36/L.37) composed of two papers entitled "Is the sea level falling or the land rising in south-east Alaska?" and "Establishment of tide gauges preparatory to the development of national geodetic networks". In concluding the discussion, the Committee proposed a draft resolution on the subject for adoption by the Conference.^b

^b Adopted, without change, as resolution 21, "Observation of seismic sea wave and storm surge".

*Classification and standards
of accuracy for geodetic control surveys [item 10 (b)]*

This item was brought up at the Conference by the United States of America in connexion with resolution 5 adopted at the Second United Nations Regional Cartographic Conference for Asia and the Far East, held in Tokyo in 1958.^c

The attention of the Committee was drawn to the Report of Study Group No. 14 of the International Union of Geodesy and Geophysics (IUGG), presented at the Helsinki meeting of the IUGG in 1960, which, in the opinion of the United States of America, was relevant to the subject under discussion. The Committee noted that no adverse comment had been submitted with respect to the application of the principles embodied in the Report of Study Group No. 14, that some countries had made it known that they had already established similar procedures on drafting their specifications, and that these countries offered copies of the material to any interested country.

The Committee recommended that the Report of the Study Group should also receive careful consideration from the countries in the region, since the standards included in the document had already received favourable consideration throughout the world, and proposed a draft resolution for adoption by the Conference.^d

International connexion of geodetic co-ordinates [item 10 (c)]

The Committee considered the two papers submitted, respectively, by Australia and Thailand on the subject (E/CONF.30/L.1 and L.3), together with the views expressed by its members during the discussion, and noted the following:

(a) Several links of the geodetic chain between Europe and the Far East have not yet been connected, in particular (i) the link between the Federation of Malaya and Thailand and (ii) the link between Singapore, the Borneo Territories and the Philippines on the one hand and that between Singapore and Australia through Indonesia on the other;

(b) With the modern equipment now available, it would be feasible to effect these junctions in order to consolidate the geodetic surveys of the region;

(c) The generous offer of the United States of America to assist in carrying out some measurements which would require the use of long-range electronic measuring equipment and related technical facilities;

(d) The desirability of maintaining liaison with Brigadier Bomford and other eminent geodesists who might be retained to study related subjects contained in the deliberations of the Eleventh Assembly of the International Union of Geodesy and Geophysics in Toronto

^c See *Second United Nations Regional Cartographic Conference for Asia and the Far East, Vol. 1 — Report of the Conference* (Sales No.: 59.I.9), page 8.

^d Adopted, without change, as resolution 7, "Classification and standards of accuracy for geodetic surveys".

in 1957, as suggested by Mr. Laclavère, the Secretary-General of that organization.

The Committee unanimously agreed on a draft resolution for adoption by the Conference.^e

Establishment of standard base lines for calibrating radio-electronic or electromagnetic distance measuring instruments [item 10 (d)]

The representative of India informed the Committee that although it had proposed this item, the long base line planned by India had not yet been established in accordance with resolution 3 of the Tokyo Conference, "Establishment of long standard base lines for calibrating geodimeters and other radio-electronic and electromagnetic devices, as well as for assuring the accuracy of networks".

The delegate of the Philippines reported to the Committee that a base line exceeding ten kilometres had been under consideration in his country to be used in calibrating and checking the performance of tellurometers. He asked for advice as to what method could best be used to make the necessary accurate measurements. The representatives of Australia, Canada, the Federal Republic of Germany, India, Japan, the Netherlands, the United Kingdom and the United States reported their respective experiences, but it was agreed that no definite conclusion could be reached on the relative merits, for the purpose of calibrating tellurometers, of a short base line of approximately one kilometre or a long base line of ten kilometres. It was pointed out that one solution to the problem could be found in the use of the geodimeter, a relatively more precise instrument for measuring the required base line. Mention was also made of a laboratory check on the frequencies of the crystals of the tellurometers to ascertain the accuracy of the instruments, but the opinion was expressed that the calibration of the instruments with a base line could be used for testing both the instruments and the operators. In answer to the question raised by the delegate of the Philippines, the representative of Japan prepared a short study of this question entitled "Establishment of a standard base line for calibrating radio-electronic or electromagnetic distance measuring instruments" (E/CONF.36/L.88). The delegate of Japan concluded that the actual method to be used for the measurement of the base line must be selected according to the purpose for which the base line is to be used.

Gravity [item 10 (e)]

The Committee considered two questions: "Gravity observation of national gravimetric nets and their international connexion" and "Gravity observations in the Bay of Bengal and the Arabian Sea", and, as a result of the discussion on the subject, agreed on a draft resolution for adoption by the Conference.^f

^e Adopted, without change, as resolution 6, "International connexion of geodetic co-ordinates".

^f Adopted, without change, as resolution 8, "Gravity".

ANNEX II

Report of Committee II on topography and photogrammetry

Review of new techniques and developments [item 13 (a)]

Electronic distance measuring instruments for third and fourth-order control

In consideration of sub-item 13 (a) of the agenda, the Committee noted the paper entitled "Tellurometer operations in topographic mapping" (E/CONF.36/L.46), submitted by the United States of America. During the discussion, note was taken with interest of the various methods adopted to eliminate swing.

The Committee realized that continuous improvement was being made in electronic distance measurement instruments, especially with regard to their use as controls for both large-scale and small-scale mapping. It felt that it was now inappropriate to make reference to the old classical terms of orders of survey control and during the discussion a suggestion was made that the title of this sub-item might be amended to read: "Electronic distance measuring instruments for purposes of establishing survey control other than primary geodetic control".

Reports on techniques and developments in map compilation and reproduction

The Committee noted the six technical papers contained in document E/CONF.36/L.47, submitted by the United States of America: "M-2 stereoplotter" and "Automatic type placement system", published by the United States Army Map Service, and "The elevation meter in topographic mapping", "Contrast control for diapositives", "New sales edition of topographic instructions" and "Single-prism stereoscope", prepared by the United States Geological Survey. The representative of the United States stated that these papers were submitted for information only. No further action was required by the Committee.

New instruments and materials for scribing

The Committee noted with interest the information contained in two technical papers: one submitted by the United States of America entitled "Report on scribing" (E/CONF.36/L.48) and consisting of three parts — I, Scribing applied to modern cartography; II, Scribing applications in United States government agencies, and III, Glossary of technical terms; and the other by Japan entitled "Scribing application at the Geographical Survey Institute of Japan" (E/CONF.36/L.72). The Committee further noted that experiments were being conducted on direct scribing by plotting machines and, in particular, on revision work. These experiments already showed a substantial saving in time.

Uses of the orthophotoscope and orthophotographs

The Committee had before it two papers: "The 1960 orthophotoscope" (E/CONF.36/L.49) by the United States of America, and "Automation in cartography" (E/CONF.36/L.13) by the Federal Republic of Germany. After an exchange of views, the Committee reached certain conclusions which were embodied in a draft resolution which was submitted to the Conference for adoption.^a

New methods and techniques in photogrammetry

The Committee took note of the recent developments in aerial triangulation applying digital methods and electronic computers, as described in the technical papers submitted, respectively, by the Netherlands entitled "The present position of analytical photogrammetry" (E/CONF.36/L.28) and the United States of America (E/CONF.36/L.50), consisting of the three following papers: "Analytic relative orientation in photogrammetry" and "Report on analytical aerotriangulation", by the United States Coast and Geodetic Survey, and "Vertical aerial triangulation block adjustments", by the United States Army Map Service. As a result, a draft resolution was submitted for approval by the Conference.^b

^a Adopted, without change, as resolution 9, "Orthophotography".
^b Adopted, without change, as resolution 10, "Digital methods and electronic computers in aerial triangulation".

International standardization of map scales, format, accuracy classification and map symbols [item 13 (b)]

The Committee noted the technical paper entitled "Comparison of SCP^c and the specifications of Japanese topographic maps" (E/CONF.36/L.73), submitted by Japan. The Committee recommended that Standard Cartographic Practices as to map scales, format, accuracy classification and symbols be adopted by the countries of the region for all new mapping projects and, while recognizing that considerable progress has been made in the region with regard to this standardization, further recommended that the use of these Standard Cartographic Practices be continued where now in use and adopted by those nations which have not yet done so.

Co-operation in mapping of frontier areas [item 13 (c)]

The Committee considered the problems involved in mapping frontier areas and stressed the importance of co-operation between the countries concerned in carrying out such work. After a careful study of various aspects of the problems and the practical procedures which might help to overcome the difficulties encountered, the Committee reached conclusions which were embodied in a draft resolution submitted for adoption by the Conference.^d

Organization and operation of a national map information office [item 13 (d)]

The Committee noted with interest the information paper "The function of a national map information office" (E/CONF.36/L.51) submitted by the United States of America and received with appreciation the offer of that country's delegation to give assistance to any country which may be considering the establishment of a map and photographic information centre. The Committee considered the setting up of such a centre, particularly of national photographic libraries, to be of paramount importance; it accordingly recommended that all countries should establish archives for aerial photographs which have been taken for cartographic, resources inventory and other related purposes and should take steps to ensure that the information contained in these photographs — which were valuable, particularly to those associated with the development of natural resources — would be readily available to all those who could use it to benefit a country. The Committee prepared a draft resolution for adoption by the Conference.^e

^c Standard Cartographic Practices.

^d Adopted, without change, as resolution 11, "Co-operation in mapping of frontier areas".

^e Adopted, without change, as resolution 5, "Map information office".

ANNEX III

Report of Committee III on photo-interpretation and topical maps

I. Photo-interpretation

Review of new techniques and developments [item 14 (a)]

The Committee noted with interest the following four technical papers submitted by the United States of America (E/CONF.36/L.52): "Photogrammetric surveys for nautical charting — use of colour and infra-red photography"; "Preliminary report on the use of aerial photographs in forest inventories"; "Air-photo analysis in land utilization research", and "Application of aerial photography to the economic analysis of land-use for urban planning". The Committee particularly commended the paper dealing with the use of colour and infra-red photography as a

means of obtaining further valuable information in certain specific studies and considered that the possibilities of such techniques should be explored further. During the discussion, note was also taken of the information paper "Land use and forest resource survey in Taiwan" (E/CONF.36/L.63) submitted by China.

The Committee considered the technical paper "Basic techniques used in photo-interpretation and sampling" (E/CONF.36/L.81) submitted by Thailand. In the discussion it was pointed out that, in evaluating forest species, some difficulty had been encountered in using photographs on too small a scale. Accordingly, photographs taken at one standard scale could not always fulfil the requirements of the various resources surveys.

The Committee also noted the background information contained in the communication E/CONF.36/L.60, submitted by the United States of America, dealing with the following subjects: "Application of aerial photographs and regression techniques for surveying the Caspian forests of Iran"; "Some recent developments of basic significance for photo-interpretation", and "Investigations in the use of colour photography for geologic purposes".

The Committee also noted the information contained in the paper by the United States of America, "Topical interpretation from aerial photographs" (E/CONF.36/L.68), and the communication submitted by Thailand entitled "Limitation on the application of photo-interpretation" (E/CONF.36/L.18).

Exchange of interpretation key and material among regions lying on the same climatic belts and zones [item 14 (b)]

The Committee considered the two papers entitled "Exchange of interpretation key among regions lying on the same climatic belts and zones" and "Exchange of materials and relevant information among regions lying on the same climatic belts and zones" (E/CONF.36/L.19 and L.22) submitted by Thailand. Attention was drawn to the fact that these papers were prepared for the purpose of implementing paragraph (e) of resolution 24 "Photo-interpretation", of the Second United Nations Regional Cartographic Conference for Asia and the Far East,^a which recommends the mapping agencies in this region "to further the exchange of experiences with other agencies in the field".

After an extensive discussion on the usefulness and methods of exchange of material in this field, it was agreed unanimously that such exchanges among member countries within the region must contribute to the improvement not only of techniques but also of neighbourly relations, strengthening international co-operation in this field. In view of the high cost of reproducing such information, the Committee did not consider it feasible to recommend the general distribution of complete documentation, but did recommend that, as a first step towards attainment of the goal sought, an exchange of lists of information which could be made available should be initiated at once. It was noted that the Cartographic Section of the United Nations would be able to offer assistance in the preparation of any lists of available information.

II. Topical maps

Review of new techniques and developments [item 15 (a)]

The Committee noted and commended the valuable information contained in the document "Review of the reports of the working groups on geology, soils and hydrology of the Committee on Special Maps, Commission on Cartography, Pan-American Institute of Geography and History" (E/CONF.36/L.53), which was submitted by the United States of America. The Committee also took note of the communication "Topical maps and national atlases" (E/CONF.36/L.65/Rev.1) submitted by China, which reiterated the hope expressed at the previous conferences "that

^a *Second United Nations Regional Cartographic Conference for Asia and the Far East, Vol. I — Report of the Conference* (Sales No.: 59.I.9), page 11.

the United Nations Technical Assistance Programme, including the Special Fund programme, should give special support to resources survey projects".

Note was taken of the information paper submitted by Thailand entitled "Methods of preparation and production of topical maps" (E/CONF.36/L.15). The Committee, while considering document E/CONF.36/L.17 submitted by Thailand on the subject "Types and scales of topical maps", noted that topical maps for varying types of economic development must be prepared on differing scales in accordance with national needs and recommended that topical maps for regional use should be prepared on standard scales, as for example, 1:5,000,000.

Small-scale base maps (scales 1:250,000 to 1:5,000,000) for use in preparing topical maps [item 15 (b)]

The Committee noted the information data listed in the paper "Some typical examples of small-scale base maps (1:250,000 - 1:12,000,000) for special-purpose mapping" (E/CONF.36/L.54), submitted by the United States of America, and the technical paper submitted by the Federal Republic of Germany, "Prospective considerations on smaller scales" (E/CONF.36/L.71).

Projection system, conventional signs, legends and romanization for topical maps [item 15 (c)]

The Committee considered the paper "Regional projection system for topical maps" (E/CONF.36/L.21) submitted by Thailand, and noted with interest the desire expressed in this paper for research in establishing topical map projections covering populated areas in the region and for co-operation between the interested nations and institutions. In particular, the Committee noted and commended the offer made by the delegation of Japan to co-operate with Thailand in this matter by correlating the data necessary for the preparation of regional topical maps on desirable projections, hoping that the outcome of this joint venture might be of some significance towards the publication of the first experimental regional topical maps before the next conference.

The Committee also noted the information paper "Conventional signs, legends and romanization" (E/CONF.36/L.16) submitted by Thailand and, recognizing the difficulties in standardizing specifications for topical maps, recommended that, wherever possible, the names of geographical features should be translated and not transliterated.

Regional atlas [item 15 (d)]

The Committee considered the technical paper, "Compilation of a regional stereoscopic and anaglyphic atlas" (E/CONF.36/L.20), together with the communication on a "Proposal for the establishment of a central organization for compiling and printing a regional economic atlas for Asia" (E/CONF.36/9 and Add.1), both submitted by Thailand, and after discussing the subject matter contained in these papers, decided to submit a draft resolution for consideration by the Conference.^b

^b Adopted, without change, as resolution 12, "Regional economic atlas".

ANNEX IV

Report of Committee IV on the International Map of the World, World Aeronautical Charts and geographical names

I. International Map of the World on the Millionth Scale (IMW) and ICAO World Aeronautical Chart (WAC)

The Chief of the Cartographic Section of the United Nations stated that the United Nations Technical Conference for the purpose of revising the specifications of the International Map of the World

on the Millionth Scale (IMW) would be held in 1962 at Bonn Federal Republic of Germany. He called the attention of the delegates to the need for reaching concrete solutions at that Conference and felt that the countries adhering to the IMW should make thorough preparations in that connexion. He requested membe

countries to attach sample sheets to their proposals and to produce 120 copies of each paper they prepare so that they could be circulated among member countries, for consultation. He also reminded the Committee that the Economic and Social Council had requested a study on the desirability of showing vegetation on IMW sheets, including woods, land under cultivation, scrub, pasture land, etc., and said that he would appreciate preliminary views on the matter.^a

Specifications of the International Map of the World on the Millionth Scale (IMW) [item 17]

The Committee began consideration of this item with the paper, "Views on sheet line and projection systems for IMW and WAC series" (E/CONF.36/L.6), in which Japan suggested that, under certain geographical circumstances, it should be permissible to vary the standard parallels of IMW sheet lines.

The representatives of China, India, Japan and Thailand, while recognizing that standardization of sheet lines should be the ultimate goal, felt that its application should be effected with a good deal of flexibility in the countries of the region. The delegate from the United States of America stated that his country's position remained the same as that taken at the Second United Nations Regional Cartographic Conference for Asia and the Far East, held in Tokyo in 1958.^b

After an exchange of views on the subject, the Committee recommended that the question of sheet lines be referred to the Bonn Conference, where it should be considered taking into account present conditions existing in the ECAFE region.

The views in the paper submitted by Thailand, "Specifications for the IMW series" (E/CONF.36/L.7), were concerned with achieving consistency and uniformity in the IMW series. The following points were brought out: (a) a projection system should be selected for areas from 0° to 44° latitude North and South; (b) a definite numbering system should be adopted in order to facilitate the merging of adjoining sheets; (c) symbols representing individual national forms or cultural features should be shown in the specifications; (d) simple and accurate transliteration rules should be adopted; (e) a single system for measuring should be employed, namely, the metric system, and (f) details for marginal information should be standardized, both with respect to their positioning and their arrangement on a sheet.

The representative of Japan felt that the methods of preparation and circulation of the IMW should be revised. He suggested that a catalogue of IMW sheets and other useful international maps might be issued periodically, together with the names of the publishers, the methods applied for their preparation and similar information. In the light of the current progress in cartographic techniques, he also suggested that signs and symbols should be modernized, including those used to show topography.

Several countries favoured the use of modified polyconic projection, while others preferred the Lambert conformal conic projection. The representative of Thailand suggested that the Universal Transverse Mercator projection might be applied between parallels 0° and 44° North and South, and that the Lambert conformal conic projection could be used between parallels 44° and 80° North and South, with the stereographic projection used north or south of 80° latitude. The representative of France emphasized that the projection system should be designed for all uses, in particular for aviation.

Several representatives expressed the opinion that special conventional signs should be used on the IMW sheets for some specific areas.

^a See *Official Records of the Economic and Social Council, Twenty-seventh Session, Supplement No. 1*, resolution 715 C (XXVII).

^b See *Second United Nations Regional Cartographic Conference for Asia and the Far East, Vol. 1 — Report of the Conference*, resolutions 30 and 31, page 12.

Viewpoints differed on whether and how vegetation could be shown on the IMW. The majority of the delegates were against overloading the Map with cumbersome symbols, but the representatives of India and Thailand pointed out that in certain cases an indication of the vegetation cover would help air navigation. All the Committee members agreed, however, that the main purpose of the IMW was to serve as a basis for the establishment of topical maps.

Since numerous and complex problems were raised by the revision of the IMW specifications, and with a view to facilitating the work of the Bonn Conference, the Committee submitted two draft resolutions for adoption by the Conference.^c

II. Geographical names

Geographical names [item 18]

The representative of Thailand, recalling that the three United Nations working languages were not the basic languages in the countries of the region, recommended that each country should adopt a simple and uniform system of transliteration. He also suggested that certain geographical names, such as names of islands, rivers, etc., be translated, rather than transliterated. The representative of the United States of America noted the efforts already made in connexion with standardization in the field of transliteration of place names, and pointed out that progress in this field was inevitably slow. The Committee agreed unanimously that there was no transliteration system that could at present convey the exact pronunciation of every word.

The Chief of the Cartographic Section of the United Nations reminded the Committee of the recommendations of the Economic and Social Council^d that countries should take steps for early implementation of the recommendations by the Group of Experts on Geographical Names for the standardization of place names in their own countries.

The Committee took note with interest of the information supplied in the communication by the United States of America, "Recent developments in international standardization of geographic names" (E/CONF.36/L.58), outlining recent achievements in this field since the Second United Nations Regional Cartographic Conference for Asia and the Far East. In conclusion, the Committee agreed on a draft resolution for adoption by the Conference.^e

III. Aeronautical charts

Aeronautical charts [item 16]

The Committee considered the six technical and information papers submitted by the United States of America: "Recent developments in cartographic methods and techniques"; "Photogrammetric surveys for aeronautical charting"; "Effect of stratified airspace systems on aeronautical charting"; "Cartographic development at scale 1:1,000,000" (E/CONF.36/L.55); "Progress made in international standardization of aeronautical charts and flight information publications" (E/CONF.36/L.56), and "Aviation's challenge to aeronautical cartography" (E/CONF.36/L.57). The Committee noted these papers with interest and concluded after the discussion by submitting two draft resolutions to the Conference for adoption.^f

^c Adopted, without change, as resolutions 13, "United Nations Technical Conference on the International Map of the World on the Millionth Scale (IMW)", and 14, "Specifications of the International Map of the World on the Millionth Scale (IMW)".

^d See *Official Records of the Economic and Social Council, Thirty-first Session, Supplement No. 1*, resolution 814 (XXXI).

^e Adopted, without change, as resolution 15, "Geographical names".

^f Adopted, without change, as resolutions 16, "Aeronautical information for compilation of charts", and 17, "Exchange of information for compilation of charts".

ANNEX V

Report of Committee V on magnetic surveys and world magnetic charts, and on hydrography and oceanography

Magnetic surveys and world magnetic charts [item 11]

The Committee discussed the paper submitted by the United States of America, "Magnetic surveys and world magnetic charts" (E/CONF.36/L.38), and heard a brief statement by the representative of that country on the magnetic work scheduled to be carried out by the United States Coast and Geodetic Survey in connexion with the forthcoming International Indian Ocean Expedition. The Committee congratulated the United States on its substantive contribution to the World Magnetic Survey. The Committee also noted with interest the Japanese programme for the World Magnetic Survey for the period 1960 to 1965, together with the equipment developed. The programme envisaged by India was also discussed.

The Committee, recognizing the importance of magnetic data for the study of the ocean and other scientific work, recommended that the countries bordering the Indian Ocean should intensify their magnetic observations ashore in co-ordination with the International Indian Ocean Expedition so that maximum benefit could be derived from both the shore observations and the ocean observations, and prepared a draft resolution on this matter.^a

Hydrography and oceanography [item 12]

The Committee had before it the reports submitted by India (E/CONF.36/L.69), Japan (E/CONF.36/L.61), the Philippines (E/CONF.36/L.74), the United Kingdom (E/CONF.36/L.84) and the United States (E/CONF.36/L.29) on the progress of their hydrographic work. During the discussion, the representative of the United States of America briefly described the instruments and equipment which were to be used in the three kinds of ships assigned by the United States to the International Indian Ocean Expedition for hydrographic surveying and oceanographic observations. The representative of Japan informed the Committee that studies of sea-bottom subsidence were being carried out in some Japanese harbours. The Committee also noted that Cambodia and Ceylon had initiated the establishment of a hydrographic section in their respective mapping agencies. A draft resolution was prepared on the matter discussed.^b

New instruments in hydrography and new hydrographic techniques in oceanography

The Committee received eight information papers from the United States of America dealing with the following subjects: "D. M. Raydist", "Echo sounding instruments", "Telemeter tide information" and "Sound velocity studies", published by the United States Coast and Geodetic Survey, and "Hi-Fix", "Precision depth recorder", "Precision graphic recorder" and "Sound velocimeter system", prepared by the United States Navy Hydrographic Office. All of the above papers were presented to the Conference as document E/CONF.36/L.40.

With regard to Hi-Fix, the representative of the United States, in reply to an inquiry made by the representative of India, stated that further tests and evaluation work on this equipment would be forthcoming. The representative of the Federal Republic of Germany mentioned that he had been associated with certain test work on Hi-Fix and had found the results to be satisfactory. The representative of Canada reported that a tract-plotter, incorporating the graphic representation of position fixing combined with sounding, was being developed in his country. The Committee expressed the view that, under certain circumstances, the hyperbolic

^a Adopted, without change, as resolution 18, "Magnetic observations".

^b Adopted, without change, as resolution 20, "Oceanography".

system of electronic fixing would be preferable as this system permits a wider frequency spectrum to be utilized.

In reply to a question from the delegate of Saudi Arabia, the United States' representative confirmed that the results obtained in the use of the Precision Depth Recorder (PDR) Mark V in deep sea sounding were also satisfactory.

The representative of Japan supplied information on a new instrument being developed in his country for shallow water surveying, the Echo-sweeper.

The Committee considered a paper presented by the United States of America, "Planning and development of small-craft charts" (E/CONF.36/L.42), and noted the increased need for such small-craft charts due to the increase in small boat traffic and safety requirements. These charts are published on scales 1:40,000 and 1:100,000. The representative of the Netherlands mentioned that in his country navigator charts are available in booklet form for the use of both ships and small boats. The representative of Japan showed a small sample of a large-scale boat chart explaining that these were not yet readily acceptable to all users who are accustomed to the old types of charts. The representative of the Philippines reported a general increase in the sale of charts in his country as a result of the indoctrination of navigators in the use of such charts. The Committee noted with interest the development of small-craft charts so far reported.

The Committee also noted with interest the report made by the representative of France on the compilation and production of the General Bathymetric Charts of the Oceans. It was recognized that the lack of accurate charts depicting the bottom topography of the oceans is a matter of considerable concern to scientific organizations and the Committee drew the attention of the cartographic services of the region to the need for providing adequate assistance on this international project.

The Committee took note of the information paper presented by the United States of America, "Photogrammetric surveys for the production and maintenance of nautical charts" (E/CONF.36/L.44), which described a proposal to co-ordinate air photographic surveys with the production and maintenance of nautical charts.

Chart format and symbolization [item 12 (b)]

The Committee considered an information paper by the United States of America, "Nautical chart symbols and abbreviations" (E/CONF.36/L.41), to which was attached a pamphlet entitled "Chart No. 1", containing the standard symbols and abbreviations approved for use on nautical charts published by that country. One-third of the symbols and abbreviations contained in the pamphlet conform to those of the International Hydrographic Bureau (IHB) and work is being continued to bring this publication closer to the IHB specifications. The representative of the Philippines informed the Committee that his country had adopted the same format, symbols and abbreviations used by the United States. India expressed the view that other States members of the IHB should also gradually conform to the specifications and symbols recommended by the Bureau for the purpose of bringing about uniformity in nautical charts.

In conclusion, the Committee, noting that the technical resolutions adopted by the IHB have been implemented by countries throughout the world and considering it important to have uniform presentation of the charts and of the data used in the production of nautical charts and allied documents, reaffirmed resolution 14 of the Second United Nations Regional Cartographic Conference for Asia and the Far East, which recommended that the countries of the region implement technical resolutions as far as practicable

*Promotion of precise sounding for shallow waters
and continental shelves [item 12 (c)]*

The Committee noted the information on modern techniques and equipment in use in Japan and the United States of America for precise sounding in shallow waters as prescribed in documents E/CONF.36/L.4 and Add.1 and E/CONF.36/L.39 entitled, respectively, "Promotion of precise soundings for shallow waters and continental shelves", "A note on depth when the bottom is soft mud" and "Promotion of precise soundings for shallow waters and continental shelf".

The Committee agreed that, as the accurate sounding of shallow waters was useful not only to the safety of navigation but also to the delineation of submarine topography for studying the continental shelf and for engineering work, the countries of the region should promote precise sounding in shallow waters and on the continental shelf and should exchange information on the improved

hydrographic techniques applied to these surveys and on the results of the surveys. It concluded consideration of this item by drawing up a draft resolution for adoption by the Conference.^o

*Study of the representation of coastlines appearing in various charts
and maps [item 12 (d)]*

The Committee examined two papers on the subject, one by Japan (E/CONF.36/L.2) and the other by the United States of America (E/CONF.36/L.45). After an extensive discussion, in which many representatives participated, the Committee reached the conclusion that the coastlines on nautical charts should be based on the high-water line, since it can be easily identified by both surveyors and mariners.

^o Adopted, without change, as resolution 19, "Sounding of shallow waters".

ANNEX VI

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^a The numbers in square brackets indicate the item numbers on the agenda, as adopted.

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- E/CONF.36/W.1/L.4. Draft resolution on United Nations technical assistance for furthering cartographic work in the region [8]
- E/CONF.36/W.1/L.5. Informal working group on regional co-operation in cartography: Draft resolution by Japan [7, 8 and 9]
- E/CONF.36/W.1/L.6. Document withdrawn
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